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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/268,948	03/16/1999	MIGAKU TAKAHASHI		9187

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EXAMINER
CANTELMO, GREGG

ART UNIT	PAPER NUMBER
1745	24

DATE MAILED: 11/15/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/268,948	Applicant(s) TAKAHASHI	
	Examiner Gregg Cantelmo	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 October 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 10-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *2,11 and 13* is/are allowed.

6)☒ Claim(s) *1 10 12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Response to Amendment

1. In response to the amendment received October 3, 2002:

   a. The abstract objection has been withdrawn;

   b. The prior art rejection of record stands as applied to claims 1, 10 and 12.

   c. The prior art rejection of claims 2, 11 and 13 is withdrawn.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 10 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Takahashi 1993, of record and for the reasons of record.

Therein Takahashi 1993 discloses forming Fe-N onto a MgO substrate films using a facing (otherwise understood as opposing) target type DC sputtering apparatus (page 3040, second column and page 3041 first column). The process is performed under identical plasma conditions T_e is within a range of about 0.2 eV and 0.6 eV and N_e is about 10^9 cm-3. The result was an Fe-N sputtered film wherein only diffracted line of (002) from α' is observed (page 3041, second column).

According to the instant application, the martensite α' (002) is abbreviated to α (002). Therefore recitation of the term α (002) in the claim is read in light of the specification to represent a martensite α' (002) at the surface of the film (see page 8, lines 1-5). Thus whether the claims recite α' (002) or α (002) they are shown by the specification to be the same. Thus the α' (002) having α (002) formed at the surface, in light of the teachings of the instant specification that α' (002) is abbreviated to α (002) teaches that the α (002) is in fact α' (002).

Figs. 1 and 4 show sputtering in a nitrogen flow rate of 25%. Since the opposed DC sputtering is performed under the same plasma conditions and was performed in a nitrogen flow rate of 25% the film formed will inherently have the same properties, including permitting diffraction rays from a γ' phase to be observed. The structure of the film will be an α"-$Fe_{16}N_2$ single phase (page 3041, column 1 as applied to instant claims 1 and 10).

The iron nitride film is formed on an iron underlayer on the substrate (page 3041, first column, paragraph beginning with "[prior to the fabrication", as applied to claim 12).

Response to Arguments

4. Applicant's arguments filed October 3, 2002 have been fully considered but they are not persuasive.

a. Applicant argues that Takahashi 1993 does not specifically disclose or suggest an α' (002) with an α (002) surface formed on a substrate.

The examiner is not persuaded this position.

First, analysis of the instant application (page 8, lines 1-5) reveals that the martensite α' (002) is abbreviated to α (002). Thus there is no phase difference from the bulk orientation of the α' (002) film and surface orientation of this film since α (002) is merely an abbreviation of the α' (002) phase and each of these descriptive terms in the claim are one in the same.

Since the specification teaches that α (002) is an abbreviation for α' (002) there is no clear difference between α (002) and α' (002) and appear to be one in the same. substituting this into the instant claims teaches of an α' (002) with an α' (002) (unabbreviated α (002)) surface formed on a substrate.

Applying this to the prior art, Takahashi 1993 forms an α' (002) film and the surface of the film is α' (002) or if abbreviated as done in the instant application would be equivalent to the abbreviation of α (002) at the surface.

Thus Takahashi 1993 is held to anticipate this structure.

b. Applicant further argues that Takahashi 1993 does not disclose or suggest the co-existence of the α' and γ' phases.

The prior art appears to form the same film under the same sputtering conditions. In particular the sputtering method employs an opposing target DC sputtering apparatus using identical plasma conditions (T_e within a range of about 0.2 eV and 0.6 eV; N_e is

about 10^9 cm-3 and the nitrogen gas flow rate between 8 and 25%). All of these conditions in the instant application are identical to the conditions employed in the instant application, which forms the claimed film.

The process conditions for sputtering the iron nitride in the instant application and Takahashi 1993 reference are identical. Therefore it is expected that the prior art iron nitride film of Takahashi will inherently have co-existence of the α' and γ' phases.

In relying upon the theory of inherency, the examiner has provided a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990).

"[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977).

Applicant's arguments are not persuasive since they fail to establish clear evidence that the prior art, which appears to form the same film under the same process conditions does not inherently exhibit co-existence of the α' and γ' phases.

c. Applicant further argues that Takahashi 1993 does not disclose or suggest the that the α' phase has diffraction ways that are observed only from the α (002) surface.

As discussed above, it appears that the α' (002) phase and α (002) are one in the same (page 8, lines 1-5 of the instant application) and are interpreted as such.

The prior art appears to form the same film under the same sputtering conditions. In particular the sputtering method employs an opposing target DC sputtering apparatus using identical plasma conditions (T_e within a range of about 0.2 eV and 0.6 eV; N_e is about 10^9 cm-3 and the nitrogen gas flow rate between 8 and 25%). All of these conditions in the instant application are identical to the conditions employed in the instant application, which forms the claimed film.

The process conditions for sputtering the iron nitride in the instant application and Takahashi 1993 reference are identical. Therefore it is expected that the prior art iron nitride film of Takahashi will inherently generate an α' phase which has diffraction ways that are observed only from the α (002) surface.

In relying upon the theory of inherency, the examiner has provided a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990).

"[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977).

Applicant's arguments are not persuasive since they fail to establish clear evidence that the prior art, which appears to form the same film under the same process conditions does not inherently generate an α' phase which has diffraction ways that are observed only from the α (002) surface.

Allowable Subject Matter

5. Claims 2, 11 and 13 are allowed.

6. The following is an examiner's statement of reasons for allowance: none of the prior art of record teach, suggest or render obvious the invention of claim 2.

While Takahashi 1993 teaches of an α Fe underlayer and an iron nitride film atop the α Fe underlayer, Takahashi 1993 does not teach or suggest forming multiple alternating layers of Fe and iron nitride or further of this structure having a coercive force of 1 Gauss.

As argued by Applicant, the coercive force is achieved by providing the multiple alternating layers. Since Takahashi does not teach this, Takahashi 1993 does not anticipate claim 2. Further none of the remaining prior art of record appear to teach or suggest forming multiple alternating layers as recited in claim 2 thereby providing a structure having a coercive force of 1 Gauss.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is (703) 305-0635. The examiner can normally be reached on Monday through Thursday from 8:00 a.m. to 5:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan, can be reached on (703) 308-2383. FAX communications should be sent to the appropriate FAX number: (703) 872-9311 for After Final Responses only; (703) 872-9310 for all other responses. FAXES received after 4 p.m. will not be processed until the following business day. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

gc

Patrick Ryan
Supervisory Patent Examiner
Art Unit 1745

November 13, 2002